

Interregional Transmission Benefit Accrual Analysis

Prepared for Electricity Canada

December 2022



Energy+Environmental Economics

Energy and Environmental Economics, Inc. (E3)
44 Montgomery Street, Suite 1500
San Francisco, CA 94104

© 2022 Energy & Environmental Economics, Inc.

Memo

Realization of Canada's decarbonization ambitions will require dramatic shifts across all sectors. Reaching net-zero grid emissions by 2035 and net-zero emissions economy-wide by 2050 will require substantial investment in both electric generation and transmission. Electricity Canada retained E3 to prepare the following analysis on interregional transmission and its benefits to electricity consumers and regional economies.

The process of aggregating the benefits of transmission and allocating them to different parties is called "benefit accrual", and provides an indication of the total benefits a transmission project will provide. Benefit accrual calculations are often used to compare with the cost of a project and may be used as an indicator of the portion of the project costs each participant will fund.

E3 performed a literature review to assess the current benefit accrual landscape in the context of interregional transmission projects. The literature review covered areas focusing on (1) existing benefit accrual framework challenges and proposed solutions; (2) regional and inter-regional examples; and (3) U.S. Federal backstop authority. The general theme that is consistent across the literature is that benefit accrual and cost allocation in the context of inter-regional transmission projects are complex and challenging. Based on these findings the following key challenges to inter-regional benefit accrual frameworks are:

- **Inconsistent list of benefits:** Current lists of assessed benefits vary by region, RTO, or utility making it hard to reconcile differences in what to assess in an inter-regional transmission project. There is no universal accounting of benefit accrual.
- **Agreement on modeling assumptions:** Since benefits are often directly linked with cost allocation, modeling development and its assumptions are heavily scrutinized among participants. FERC 1000 regional transmission groups have shown that it is difficult to reach a consensus.
- **Agencies and government stakeholders often prolong, delay, or reject projects:** As is the case in the U.S., and has been seen in Canada, inter-regional transmission project development requires long lead times and incorporating diverse stakeholder views on proposed cost-benefit methodology.

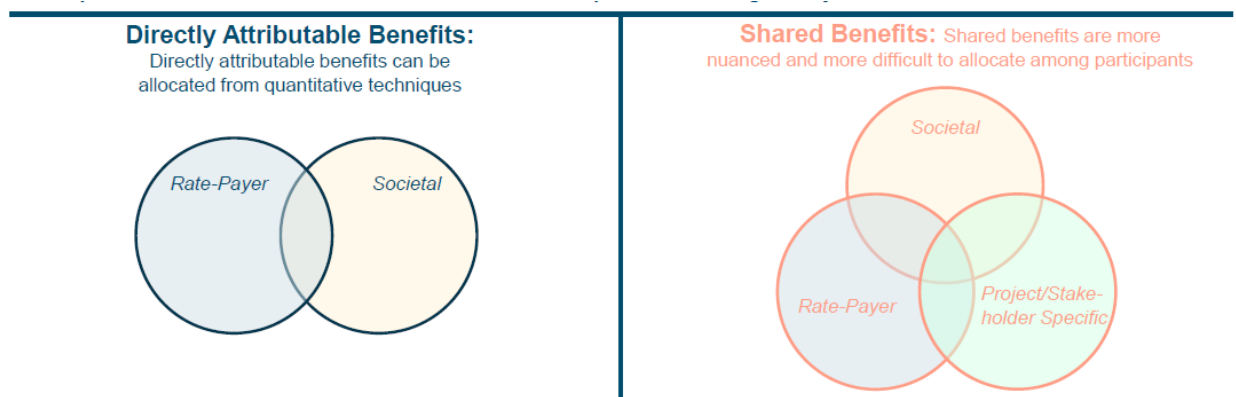
These challenges are applicable to Canadian inter-regional transmission and can be categorized as (1) benefit categorization challenges; and (2) benefit allocation challenges.

- **Categorization:** There is no federal or national benefit categorization framework. Provinces may have their own benefit categories that they use in determining a viable transmission project.
- **Allocation methodology:** Canadian interregional planning usually involves bilateral negotiation between entities but can include help from the federal government (Birtle Tantalon Transmission Line). However, recent interregional efforts have been seen on the multi-provincial Atlantic Loop transmission project.
- **Allocation authority:** Provinces or Crown corporations dictate intra-regional transmission planning and distribution planning. The Canadian federal government has some authority over

designated interregional or international projects; but is otherwise not very active in the inter-regional transmission planning process.

E3 finds that though attempts at developing inter-regional benefit accrual frameworks have been undertaken, there has yet to be a consistently effective framework for inter-regional projects with multiple parties. The core deliverable was to provide a skeleton benefit accrual calculator to Electricity Canada that would help set a baseline framework for inter-regional transmission projects and provide a jumping-off point for the Canadian transmission industry to promote healthy discussion on transmission expansion to meet national emissions goals. Given there is no perfect formula for inter-regional transmission benefit accrual, E3 started from FERC's designated list of transmission benefits to provide a base set of benefits that stakeholders would start from when looking at benefit accrual of an inter-regional transmission project. These benefits can then be categorized into *directly attributable* or *shared* and within these categorizations the benefit may be a rate-payer, societal, or dependent on the project (Figure 1). E3 also worked with Electricity Canada members to expand this list of benefits to include additional non-FERC benefits and Canada-specific benefits.

Figure 1 E3 High-level Benefit Categorization



Directly-attributable benefits are quantifiable and can be reasonably allocated among project stakeholders. The modeling and methodology that leads to these quantified benefits requires coordination between participants, however these benefits generally can be quantified and are more straightforward.

Shared benefits are more nuanced and not as easily allocated among participants. These benefits require more thought on how to distribute them for an inter-regional transmission project. An added layer of complexity is that these shared benefits most likely require negotiations with other stakeholders and partners outside of those that will be owning, using, or otherwise benefitting from the project. These parties may include First Nations and other non-energy providing entities (as it pertains to that project specifically.) Early engagement of the Federal government and all other parties in inter-regional transmission projects may help streamline the transmission project process and help Canada reach its 2035 and 2050 targets.

Assuming early engagement and support of the inter-regional project, there are two bookend cases that are helpful in describing how to handle shared benefits.

1. The first is a methodology that assumes that all shared benefits are evenly distributed among transmission project participants, regardless of the relative risks or usage of the infrastructure. Examples of this are most often found among US Regional Transmission Organizations (RTOs) where transmission providers charge a postage stamp rate to customers. While applicable to inter-regional transmission, it may be more challenging to integrate across regions.
2. Alternatively, the other end of the shared benefit allocation spectrum could involve the Federal government. In this scenario, the Federal government would act as a monetary stopgap or become an investor in the inter-regional transmission project. Direct Federal involvement may help lower the hurdle to transmission projects that may have otherwise seemed unrealistic resulting in more transmission development US Department of Energy's (DOE) Build a Better Grid Initiative has proposed a Transmission Facilitation Program that looks to fund new high voltage transmission through: (1) DOE loans, (2) DOE participation in public-private partnership, (3) capacity contracts that would make DOE the "anchor tenant" of a line.

E3 provided a calculator to Electricity Canada that incorporates the methodology above. The skeleton calculator provides a starting point for entities interested in inter-regional transmission planning to promote discussion and engage all electricity sector stakeholders. General topics for regulatory proceedings on inter-regional transmission benefit accrual can also help promote this topic and move Canada towards implementing a framework. The two main areas E3 proposed to focus on were:

1. Setting a Canadian-wide interregional transmission planning framework. Establishing a methodology that can be used for all interregional transmission projects will help reduce friction between parties involved in the projects and reduce the time between project conceptualization and getting poles in the ground.
2. Expanding the role of the Federal government to help move the transmission process forward and establish a potential future Canadian interregional transmission planning framework. Federal involvement can bring credibility to a project in development. It can also help push projects forward through direct funding or guiding any future transmission planning framework if there are points of contention for a project.

Conclusion

The calculation and allocation of benefits resulting from inter-regional transmission projects is challenging because benefits are both hard to quantify and unique to each project. In reviewing inter-regional transmission in a Canadian context, E3 identified three core barriers to success including inconsistent categorization of benefits, modeling assumptions used in their quantification, and long-lead times due to complex stakeholder processes. In order to support more efficient calculation and categorization of inter-regional transmission benefit accruals, E3 has developed and provided to Electricity Canada a framework for benefit accrual based on cost being defined as either direct or shared, and then further broken down into ratepayer, societal, or project specific. This framework is provided as a calculator and intended to be a launching point for future transmission to promote healthy and exhaustive discussion on transmission expansion to meet national emissions goals.